to air, derived from the sphenoid sinuses, (Pl. XXX. fig. 2.) The vertical diameter of the cranial cavity is four inches, eight lines; its transverse diameter, which is greatest in the posterior third part of the cavity, corresponding with the posterior part of the cerebrum is six inches: from the indications afforded by the remains of the cranial cavity in Mr. Darwin's specimens, I conclude that the brain of the Megatherium was more depressed, and upon the whole, smaller by nearly one-half than that of the Elephant; but with the cerebellum relatively larger, and situated more posteriorly with relation to the cerebral hemispheres: whence it may be concluded that the Megatherium was a creature of less intelligence, and with the command of fewer resources, or a less varied instinct than the Elephant.

It has been usual to characterize the Megatherium, in conformity with the concurrent descriptions of Bru, Cuvier, and D'Alton, by the dental formula of *molares* $\frac{4}{4}\frac{4}{4}$, i. e. by the presence of four grinding teeth on each side of the upper, as of the lower jaw. It was the agreement of the excellent authorities above cited in this statement, which induced Mr. Clift and myself to regard a single detached tooth, which formed part of the valuable collection of remains of the Megatherium deposited in the Hunterian Museum by Sir Woodbine Parish, as being, from its comparatively small size, the tooth of either a younger individual or of a smaller species of Megatherium. Upon clearing away the matrix from the palatal and alveolar surface of one of the cranial fragments of the Megatherium in Mr. Darwin's collection, I was gratified by the detection of the crown of a fifth molar, corresponding in size and form with the detached tooth, above alluded to: its small size, and its position have doubtless occasioned its being over-looked in the cranium of the great skeleton at Madrid.

The anterior molar of the upper jaw presents a nearly semicircular transverse section, with the angles rounded off; the three succeeding teeth are four-sided, with the transverse somewhat exceeding the antero-posterior diameter: they are rather longer and larger than the first: the last molar is likewise four-sided, but presents a sudden diminution of diameter, and is relatively broader. The following are the respective dimensions of the upper maxillary teeth.

	First Molar.		Second Molar.		Third Molar.		Fourth Molar.		Fifth Molar.	
	In.	Lines.	In.	Lines.	In.	Lines.	In.	Lines.	In.	Lines.
Length	8	6	9	4	9	4	8	7	5	2
Transverse diameter . .	1	9	2	4	2	3	2	0	1	4
Antero-posterior diameter .	1	5	2	0	2	0	1	11	0	10

Besides the differences in size, the upper molars vary as to their curvature: this difference is exhibited in the vertical section of these teeth figured in Pl. XXXI. The convexity of the curve of the first, second and third molars is directed

forwards; the fourth is straight, its anterior surface only describing a slight convexity in the vertical direction; the fifth tooth is curved, but in a contrary direction to the others; and the bases of the five molars thus present a general convergence towards a point a little way behind the middle of the series.

The next peculiarity to be noticed in these remarkable teeth is the great length of the pulp-cavity (*d*), the apex of which is parallel with the alveolar margin of the jaw: a transverse fissure is continued from this apex to the middle concavity of the working surface of the tooth, which is thus divided into two parts. Each of these parts consists of three distinct substances,—a central part analogous to the body or bone of the tooth or 'dentine,' a peripheral and nearly equally thick layer of *cæmentum*, and an intermediate thinner stratum of a denser substance, which is described in Mr. Clift's memoir on the Megatherium as 'enamel,' and to which substance in the compound teeth of the Elephant, it is analogous both in its relative situation, and relative density to the other constituents.

Microscopic examinations of thin and transparent slices of the tooth of the Megatherium prove, however, that the dense layer separating the internal substance from the cæmentum is not enamel, but presents the same structure as the hard 'dentine' or ivory of the generality of Mammalian teeth; and corresponds with the thin cylinder of hard 'dentine' in the tooth of the Sloth. No species of the Order *Bruta* has true enamel entering into the composition of its teeth; but the modifications of structure which the teeth present in the different genera of this order are considerable, and their complexity is not less than that of the enamelled teeth of the Herbivorous Pachyderms and Ruminantia, in consequence of the introduction of a dental substance into their composition corresponding in structure with that of the teeth of the *Myliobates*, *Psammodus*, and other cartilaginous fishes.

The microscopic investigation of the structure of the teeth of the Megatherium was undertaken chiefly with the view of comparing this structure with that of the teeth of the Sloth and Armadillo, and of thus obtaining an insight into the food, and an additional test of the real nature of the disputed affinities of the Megatherium. The central part of the tooth (*c*. Pl. XXXI.) consists of a coarse ivory, like the corresponding part of the tooth of the Sloth. It is traversed throughout by medullary canals $\frac{1}{1500}$th of an inch in diameter, which are continued from the pulp-cavity, and proceed, at an angle of 50°, to the plane of the dense ivory, parallel to each other, with a slightly undulating course, having regular interspaces, equal to one and a half diameters of their own areæ, and generally anastomosing in pairs by a loop of which the convexity is turned towards the origin of the tubes of the fine dentine, as if each pair so joined consisted of a continuous reflected canal, (*c*. fig. 1, Pl. XXXII.) The loops are gene-